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PATENT SPECIFICATION

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(54) CONTAINERIZED WAX CANDLE

(71) We, KENSUKE TSUDA, a Japanese Nationality of 1660, Kusanagi, Shimizu-shi, Shizuoka-ken, Japan and Shunsuke Tsuda, a Japanese Nationality of 585-55, Mabase, Shimizu-shi, Shizuoka-ken, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:-

The present invention relates to a containerized wax candle with a wick assembly embedded in a mass of wax filled in a container.

Conventional wax candles with standard composition have commonly a wick made of cottong string which is embedded in the center of a mass of wax formed in cylindrical or other shapes or filled in a container. This type of wick burns with the combustion of the wax. There has conventionally been introduced such a containerized wax candle wherein the embedded wick does not burn. However, such containerized wax candles have poor wick wax saturation, undesired self-extinguishing in use, and non-or-poor ignition with intermittend use.

According to one aspect the invention provides a containerized wax candle including a container filled with a solid mass of wax, the candle comprising:

a metallic wick pipe embedded at its lower portion in the solid mass of wax and provided in its periphery with means providing communication between the exterior and the interior of said pipe;

a wick element inserted within said pipe, said wick element projecting at its top end out of said pipe and having its lower end within the wax;

and a metallic heat receiver provided on the top end of said pipe and formed so as to surround the projecting top end of said wick element;

whereby in use when said wick element is ignited at its projecting top end, the solid mass of wax is melted by the burning heat given to said pipe by way of said heat receiver and subsequently saturates said wick element through said communication means.

According to a further aspect the invention provides a containerized wax candle including a container filled with a solid mass of wax, the candle comprising:

a metallic wick pipe embedded at its lower portion in the solid mass of wax and provided in its periphery with means providing communication between the exterior and the interior of said pipe;

a wick element inserted within said wick pipe, said wick element projecting at its top end out of said wick pipe and having its lower end within the wax;

and a metallic heat pipe surrounding said wick pipe and being embedded in the solid mass of wax concentrically with said wick pipe, said heat pipe having a heat receiver surrounding the projecting top end of said wick element and being provided in its periphery with means providing communication between the exterior and the interior of said heat pipe;

whereby in use when said wick element is ignited at its projecting top end, the solid mass of wax is melted by the burning heat given to said heat pipe and subsequently saturates said wick element through said communication means in said wick pipe and in said heat pipe.

For a better understanding of the present invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a partially broken perspective view of a containerized wax candle with a wick assembly in accordance with the present invention;

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Figure 2 depicts a metallic base disc to be assembled with the wick assembly shown in Figure 1;

Figure 3 is a perspective view of a metallic wick pipe to be assembled with the wick assembly shown in Figure 1;

Figure 4 shows a wick element to be inserted within the wick pipe of Figure 3;

Figures 5 and 6 illustrate modifications of the heat receiving portion of the metallic wick pipe shown in Figure 3;

Figure 7 is a view of the vertical cross-section of a modification of the wick element shown in Figure 4;

Figure 8 is a plan view of the wick element shown in Figure 7;

Figure 9 is a partially broken perspective view of a containerized wax candle having a wick assembly in accordance with another embodiment of the present invention;

Figure 10 depicts a metallic base disc to be assembled with the wick assembly shown in Figure 9;

Figure 11 is a perspective view of a metallic wick pipe to be assembled with the wick assembly shown in Figure 9;

Figure 12 shows a wick element to be inserted within the wick pipe of Figure 11; and

Figure 13 is a perspective view of a heat pipe to be assembled with the wick assembly shown in Figure 9.

Now referring to the accompanying drawings, in Figure 1, there is disclosed a first preferred embodiment of the present invention wherein a container 10 has a wick assembly therein. The wick assembly comprises a metallic base disc 12, a metallic wick pipe 20 and a wick 23.

The metallic base disc 12 is placed on the bottom 11 of the container 10 and, as best illustrated in Figure 2, provided with a center hole 13 to have the lower end of the metallic wick pipe 20 fixedly engaged therein. The metallic base disc 12 is further provided at the outer rim thereof with three legs 14 to prevent the body portion of the base disc 12 from engaging directly with the bottom 11 of the container 10.

As best shown in Figure 3, the metallic wick pipe 20 has at the top thereof an integral heat receiving portion 21 which comprises four upright heat receiving tabs 21a. Formed in the periphery of the metallic wick pipe 20 is an axial slit 22 which constitutes means providing communication between the exterior and the interior of the pipe 20. The wick 23 (Figure 4) is made of glass fiber, cotton fiber, carbon fiber, metallic filament or combinations of them, which are gathered in a bunch or woven in a string. This wick 23 is inserted within the metallic wick pipe 20 and the top end 23a is exposed in the space surrounded by the heat receiving tabs 21a of the wick pipe 20.

Thus, the wick assembly is set up by inserting the wick 23 in the metallic wick pipe 20 and mounting the lower end of the wick pipe 20 fixedly into the center hole 13 of the base disc 12. The set-up wick assembly is placed inside the container 10 which is then filled with a predetermined quantity of molten wax C. When the filled-in wax C is chilled and hardened, a containerized wax candle is completed.

When the top 23a of the wick 23 is ignited, the wax contained within the wick 23 starts burning. A portion of the burning heat is immediately absorbed into the heat receiving portion 21 surrounding the oxidizing flame. This burning heat is given directly to the wax C filled in the container 10 by way of the wick pipe 20 and in turn, the metallic base disc 12 receives thereon the burning heat so that the solid or hardened wax C in the container 10 melts into fluid in a short period of time. The molten wax is saturated into the wick 23 by way of the axial slit 22 of the wick pipe 20 and reaches the ignited point 23a of the wick 23 by capillary effect in the wick, thereby to maintain the burning at the ignited point 23a. During the above-mentioned combustion, only the wax absorbed up to the ignited point 23a burns and the wick 23 itself does not burn. At the bottom 11 of the container 10, little heat is conveyed to the container 10 due to the construction of the metallic base disc 12 so that the container 10 will never be heated directly. Thus, the combustion will be maintained as long as the wax remains in the container 10. When the originally filled wax is almost used up, the combustion will also be maintained by adding regular wax into the container 10.

Figures 5 and 6 illustrate modifications of the heat receiving portion 21 of the metallic wick pipe 20. In Figure 5, a helical-shaped heat receiving coil 21b is connected to the top end of the metallic wick pipe 20 and, in Figure 6, a heat receiving metallic net 21c of a cup shape is coupled to the top end of the metallic pipe 20. Moreover, it should be clearly understood that the slit 22 provided on the wick pipe 20 may be replaced by a plurality of axially spaced holes drilled in the circumference of the wick pipe 20, yet the wax saturating effect remaining unchanged.

Figures 7 and 8 illustrate a modification of the wick 23. In these Figures, a wick 24 is made in the same manner with the same materials as explained in the above embodiment and inserted into the metallic wick pipe 20. The distinguished feature of this wick 24 is a small diameter projection 24a provided at the top end of the wick 24, the projection 24a including a wire filament 25 at the center thereof. With this modified wick 24, the ignition will become easier thanks to the small diameter projection 24a

exposed over the top end of the pipe 20 and the wire filament 25 speeds up the melting of the wax contained within the wick 24 by the high heat conductivity thereof. Thus, the combustion is conducted only at the projection or burning point 24a so that no carbon or soot is collected at the burning point of the wick 24 and adjustments of the projected portion 24a enables the desired sizes and shapes of the flame to be obtained.

In Figures 9 to 13, there is disclosed a second preferred embodiment of the present invention in which a wick assembly comprises a metallic base disc 112, a metallic wick pipe 120, a wick 123 and a heat pipe 130. The metallic base disc 112 is placed on the bottom 111 of a container 110 and is provided with a center hole 113 to have the lower end of the metallic wick pipe 120 fixedly engaged therein, as best shown in Figure 10. The metallic base disc 112 is further provided with a pair of arcuated slits 115 concentric around the center hole 113 to receive therein the lower end of the heat pipe 130. At the outer rim of the base disc 112, three legs 114 are provided to prevent the body portion of the metallic base disc 112 from engaging directly with the bottom 111 of the container 110. The metallic wick pipe 120 has an axial slit 122 corresponding with the axial slit 22 of the previous wick pipe 20 shown in Figure 3 i.e. constituting communication means providing communication between the exterior and the interior of the wick pipe 120, and the wick 123 has the same construction as the wick 23 of the first embodiment. This wick 123 is inserted into the metallic wick pipe 120 and exposed at its top end out of the wick pipe 120, as seen in Figure 9.

Figure 13 illustrates the heat pipe 130 which has a diameter larger than that of the wick pipe 120 and is integrally provided at the top end thereof with a pair of heat receiving tabs 131 for surrounding the exposed top end 123a of the wick 123 and at the bottom thereof with a pair of legs 133 coincident with the arcuated slits 115 of the base disc 112. This heat pipe 130 is further provided with an axial slit 132 on its circumference, the slit 132 corresponding with the slit 122 of the wick pipe 120 and providing communication between the exterior and the interior of the heat pipe 130.

Thus, the wick assembly shown in Figure 9 is set up by inserting the wick 123 into the metallic wick pipe 120, mounting the wick pipe 120 into the center hole 113 of the metallic base disc 112 and coupling the heat pipe 130 over the wick pipe 120, the legs 133 being fixedly engaged with the arcuated slits 115 of the metallic base disc 112. The set-up wick assembly is placed inside the container 110 which is then filled with a predetermined quantity of molten wax.

When the filled-in wax is chilled and hardened, a containerized wax candle is completed.

When the top end 123a of the wick 123 is ignited, the wax contained within the wick 123 starts burning. The burning heat is immediately applied to the heat receiving tabs 131 surrounding the oxidizing flame. This burning heat is conveyed directly to the wax filled in the container 110 by way of the heat pipe 130 and, in turn, the metallic base disc 112 receives thereon the burning heat so that the solid or hardened wax in the container 110 melts into fluid in a short period of time. The molten wax is saturated into the wick 123 through the axial slits 132 and 122 and reaches the ignited point 123a of the wick 123 by capillary effect in the wick element 123, thereby to maintain the burning at the ignited point 123a. During this combustion, only the wax saturated up to the ignited point 123a of the wick 123 burns and the wick 123 itself does not burn. Thus, the combustion in the containerized wax candle will be maintained as long as the wax remains in the container 110.

WHAT WE CLAIM IS:-

1. A containerised wax candle including a container filled with a solid mass of wax, the candle comprising;

a metallic wick pipe embedded at its lower portion in the solid mass of wax and provided in its periphery with means providing communication between the exterior and the interior of said pipe;

a wick element inserted within said pipe, said wick element projecting at its top end out of said pipe and having its lower end within the wax;

and a metallic heat receiver provided on the top end of said pipe and formed so as to surround the projecting top end of said wick element;

whereby in use when said wick element is ignited at its projecting top end, the solid mass of wax is melted by the burning heat given to said pipe by way of said heat receiver and subsequently saturates said wick element through said communication means.

2. A containerized wax candle according to claim 1, in which said wick pipe is mounted at the lower end thereof on a metallic base plate placed on the bottom of the container.

3. A containerized wax candle according to claim 1 or 2, in which said wick element is provided at the axial center thereof with a small diameter projection to be ignited.

4. A containerized wax candle according to any one of the preceding claims, in which a wire filament is inserted within the axial center of said wick element.

5. A containerized wax candle according to any one of the preceding claims, in which

said wick element is made of glass fiber gathered in a bunch.

5 6. A containerized wax candle according to any one of the preceding claims, in which said metallic heat receiver comprises a plurality of metallic tabs integrally provided on the top end of said pipe to surround the projecting top end of said wick element.

10 7. A containerized wax candle according to any one of claims 1 to 5, in which said metallic heat receiver comprises a spiral-shaped metallic coil connected to the top end of said wick pipe.

15 8. A containerized wax candle according to any one of claims 1 to 5, in which said metallic heat receiver comprises a cap-shaped metallic net coupled to the top end of said wick pipe.

20 9. A containerized wax candle according to any one of the preceding claims, in which said communication means comprises an axial slit formed in the periphery of said pipe.

25 10. A containerized wax candle including a container filled with a solid mass of wax, the candle comprising:

30 a metallic wick pipe embedded at its lower portion in the solid mass of wax and provided in its periphery with means providing communication between the exterior and the interior of said pipe;

35 a wick element inserted within said wick pipe, said wick element projecting at its top end out of said wick pipe and having its lower end within the wax;

40 and a metallic heat pipe surrounding said wick pipe and being embedded in the solid mass of wax concentrically with said wick pipe, said heat pipe having a heat receiver surrounding the projecting top end of said wick element and being provided in its periphery with means providing communication between the exterior and the interior of said heat pipe;

45 whereby in use when said wick element is ignited at its projecting top end, the solid mass of wax is melted by the burning heat

given to said heat pipe and subsequently saturates said wick element through said communication means in said wick pipe and in said heat pipe. 50

11. A containerized wax candle according to claim 10, in which said wick pipe and said heat pipe are coaxially mounted on a metallic base plate placed on the bottom of the container. 55

12. A containerized wax candle according to claim 10 or 11, in which said heat receiver comprises a pair of tabs integrally provided on the top end of said pipe. 60

13. A containerized wax candle according to any one of claims 10 to 12, in which said communication means in said wick pipe comprises an axial slit provided in the periphery of said wick pipe. 65

14. A containerized wax candle according to any one of claims 10 to 13, in which said communication means in said heat pipe comprises an axial slit provided in the periphery of said heat pipe. 70

15. A containerized wax candle substantially as herein described with reference to and as illustrated in Figure 1 of the accompanying drawings.

16. A containerized wax candle substantially as herein described with reference to and as illustrated in Figure 9 of the accompanying drawings. 75

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Fig.1

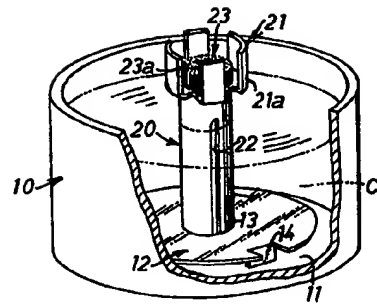


Fig.2

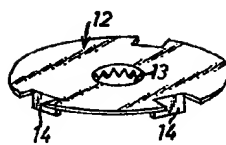


Fig.3

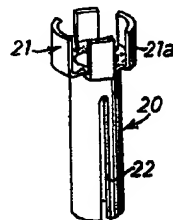


Fig.4



Fig.5

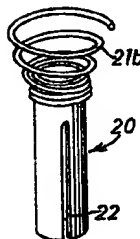


Fig.6

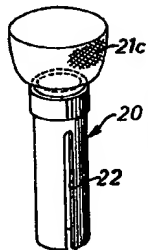


Fig.7

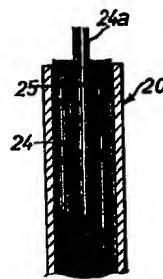


Fig.8

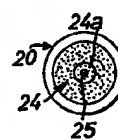


Fig.9

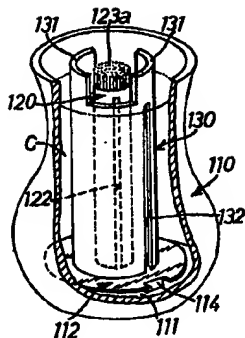


Fig.10

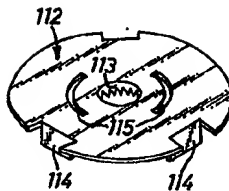


Fig.11

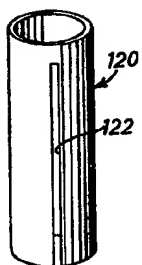


Fig.12

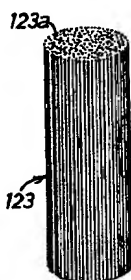


Fig.13

